

DETAILED ACTION

1. Claims 1-4, 6-21, 26-37, 39-40 are pending in this Office Action.

The filed drawing on 6/16/2004 is accepted.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Thomas Reger on 12/30/2008.

In claims:

Please replace claims 1, 9, 14 and 19 with amended claims 1, 9, 14 and 19.

Please cancel claims 2-8, 10-13, 15-18, 20-40.

1. (Currently Amended) A method of scheduling access to a database by multiple processes, comprising:

in multiple instances of a software-implemented procedure, each instance of the software-implemented procedure associated with a particular process of the multiple processes, associating a lock level with the particular process and attempting to associate a different lock level with the particular process until the particular process is granted access to the database, a higher lock level representing a larger number of other processes having priority over the particular process in accessing the database, each process of the multiple processes being associated with no more than one lock level;

repeatedly calling, using the particular process, said each instance of the software-implemented procedure to attempt to associate the particular process with successively lower lock levels until the lock level is equal to a preset value, and each time the particular process has been successfully associated with a lower lock level, releasing a previous lock level associated with the particular process so that the previous lock level is available to be associated with the other processes, the preset value equals to one;

allowing, using the software-implemented procedure, the particular process to access the database when the lock level for the particular process is equal to the preset value,

at a computer, storing, in a queue, data indicating which process is associated with which lock level, the computer including a processor;

updating, using the software-implemented procedure, the data indicating which process is associated with which lock level;

reassigning lock levels of the multiple processes when a process accessing a record terminates its access to the record, wherein the process that attempted to access the record earlier than other process is assigned a lower lock level than the other process, and said each process other than the process terminating its access to the record is assigned a lower lock level when the process terminates its access to the record, wherein the particular process changes two or more lock levels from an initially assigned lock level to the lock level having the preset value before the particular process is allowed to access the record, said each process of the multiple processes attempts to associate itself with a lower lock level independently of the other processes, and at least two processes of the multiple processes are being run in a parallel processing environment; and

allowing the multiple processes to read the record but not modify the record when the lock levels for the multiple processes are different from a preset value.

9. (Currently Amended) A method of scheduling access to a database by multiple processes comprising:

in multiple instances of a software-implemented procedure,
upon receiving a request from a first process to access a record in the database, associating a first lock level with the first process and allowing the first

process to access the record, preventing other processes from modifying the record until the first process finishes accessing the record, a higher lock level representing a larger number of other processes having priority over the first process in accessing the database, each process of the multiple processes being associated with no more than one lock level;

at a computer, upon receiving a request from a second process to access the record while the first process is still accessing the record, associating a second lock level with the second process, the computer including a processor;

upon receiving a request from a third process to access the record while the first process is still accessing the record, associating a third lock level with the third process;

when the first process finishes accessing the record, releasing the first lock level, the second and third processes each repeatedly calling one instance of the instances of the procedure respectively associated with the second process or the third process to attempt to associate itself with a lower lock level until the lower lock level is equal to a preset value, the preset value equals to one, wherein if the second process associates itself with the first lock level before the third process associates itself with the first lock level, the third process associates itself with the second lock level and repeatedly attempts to associate itself with the first lock level;

when the second process associates itself with the first lock level, permitting the second process to modify the record;

when the third process associates itself with the first lock level, permitting the third process to modify the record;

updating, using the instances of the software-implemented procedure, data indicating which process is associated with which lock level ;

storing, in a queue, the data indicating which process is associated with which lock level;

reassigning lock levels of the multiple processes when a process accessing the record terminates its access to the record, wherein the process that attempted to access the record earlier than other process is assigned a lower lock level than the other process, and said each process of the multiple processes other than the process terminating its access to the record is assigned a lower lock level when the process terminates its access to the record, wherein said each process of the multiple processes changes two or more lock levels from an initially assigned lock level to a lock level having the preset value before said each process of the multiple processes is allowed to access the record;

allowing the multiple processes to read the record but not modify the record when the lock levels for the multiple processes are different from a preset value; and

wherein said each process of the multiple processes attempts to associate itself with a lower lock level independently of other processes, and at least two processes of the multiple processes are being run in a parallel processing environment.

14. (Currently Amended) The method of claim 1 further comprising:
locking the record in the database at multiple levels when the multiple processes running in parallel attempt to access the record, said each process of the multiple processes associated with one of the instances of the procedure; and
selectively permitting one process of the multiple processes to access the record at a time.

19. (Currently Amended) A system of scheduling access to a database, the system comprising:
a memory;
a database to store records;
a queue to store information relating to lock levels of processes that attempt to access the records, each different process having a different lock level when attempting to access a same record, a process of the processes having a particular lock level, the process having the particular lock level being allowed to access the same record, a higher lock level representing a larger number of other processes having priority over a particular process in accessing the

database, each process of the processes being associated with no more than one lock level; and

a processor to:

execute multiple instances of a procedure to assign a respective lock level to each process of different processes, each process of at least some of the different processes having a lock level other than the particular lock level, each instance of the procedure associated with said each process of the processes

repeatedly call an instance of the instances of the procedure associated with the particular process to attempt to associate the particular process with another lock level that is closer to the particular lock level until the another lock level is equal to a preset value, the preset value equals to one, the procedure allowing any one process to access the record when that one process has the particular lock level;

store, in a queue, data indicating which process is associated with which lock level;

update, using the procedure, the data indicating which process is associated with which lock level;

reassign lock levels of the processes when a process accessing the record terminates its access to the record, wherein the process that attempted to access the record earlier than other process is assigned a lower lock level than the other process, and said each process of the processes other than the process terminating its access to the record is assigned a lower lock level when

the process terminates its access to the record, wherein the particular process changes two or more lock levels from an initially assigned lock level to a lock level having the preset value before the particular process is allowed to access the record, said each process of the processes attempts to associate itself with a lower lock level independently of other processes, and at least two processes of the processes are being run in a parallel processing environment; and allow the processes to read the record but not modify the record when the lock levels for the processes are different from a preset value.

Allowable Subject Matter

3. Claims 1, 9, 14 and 19 are allowed.

The prior art of record, alone or in combination, does not teach or fairly suggest the combination of steps as recited in independent claim 1, wherein "repeatedly calling, using the particular process, said each instance of the software-implemented procedure to attempt to associate the particular process with successively lower lock levels until the lock level is equal to a preset value, and each time the particular process has been successfully associated with a lower lock level, releasing a previous lock level associated with the particular process so that the previous lock level is available to be associated with the other processes, the preset value equals to one; allowing, using the software-implemented procedure, the particular process to access the database when the lock level for the particular process is equal to the preset value, at a computer, storing, in a queue, data indicating which process is associated with which lock level, the computer including a processor; updating, using the software-implemented procedure, the data indicating which process is associated with which lock level; reassigning lock levels of the multiple processes when a process accessing a record terminates its access to the record, wherein the process that attempted to access the record earlier than other process is assigned a lower lock level than the other process, and said each process other than the process terminating its access to the record is assigned a lower lock level when the process terminates its access to the record, wherein the particular process changes two or more lock levels from an initially

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assigned lock level to the lock level having the preset value before the particular process is allowed to access the record, said each process of the multiple processes attempts to associate itself with a lower lock level independently of the other processes, and at least two processes of the multiple processes are being run in a parallel processing environment";

The prior art of record, alone or in combination, does not teach or fairly suggest the combination of steps as recited in independent claim 9, wherein when the first process finishes accessing the record, releasing the first lock level, the second and third processes each repeatedly calling one instance of the instances of the procedure respectively associated with the second process or the third process to attempt to associate itself with a lower lock level until the lower lock level is equal to a preset value, the preset value equals to one, wherein if the second process associates itself with the first lock level before the third process associates with the first lock level, the third process associates itself with the second lock level and repeatedly attempts to associate itself with the first lock level; updating, using the instances of the software-implemented procedure, data indicating which process is associated with which lock level ; storing, in a queue, the data indicating which process is associated with which lock level; reassigning lock levels of the multiple processes when a process accessing a record terminates its access to the record, wherein the process that attempted to access the record earlier than other process is assigned a lower lock level than the other process, and said each process other than the process terminating its access to

the record is assigned a lower lock level when the process terminates its access to the record, wherein said each process changes two or more lock levels from an initially assigned lock level to the lock level having the preset value before said each process is allowed to access the record; allowing the multiple processes to read the record but not modify the record when the lock levels for the multiple processes are different from a preset value; and wherein said each process of the multiple processes attempts to associate itself with a lower lock level independently of other processes"; and

The prior art of record, alone or in combination, does not teach or fairly suggest the combination of steps as recited in independent claim 19, "repeatedly call an instance of the instances of the procedure associated with the particular process to attempt to associate the particular process with another lock level that is closer to the particular lock level until the another lock level is equal to a preset value, the preset value equals to one, the procedure allowing any one process to access the record when that one process has the particular lock level; store, in a queue, data indicating which process is associated with which lock level; update, using the procedure, the data indicating which process is associated with which lock level; reassign lock levels of the processes when a process accessing the record terminates its access to the record, wherein the process that attempted to access the record earlier than other process is assigned a lower lock level than the other process, and said each process of the processes other than the process terminating its access to the record is assigned a lower lock level when the process terminates its access to the record, wherein the

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particular process changes two or more lock levels from an initially assigned lock level to a lock level having the preset value before the particular process is allowed to access the record, said each process of the processes attempts to associate itself with a lower lock level independently of other processes, and at least two processes of the processes are being run in a parallel processing environment; and allow the processes to read the record but not modify the record when the lock levels for the processes are different from a preset value".

The dependent claims, bring definite, further limiting, and fully enabled by the specification are also allowed.

Contact Information

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cam Y T. Truong whose telephone number is (571) 272-4042. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tony Mahmoudi can be reached on (571) 272-4078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cam Y Truong/
Primary Examiner, Art Unit 2169